July 4, 1944. L. L. WILSON 2,352,876

COLLAPSIBLE CONDUIT

Filed July 25, 1942

FIG. 1

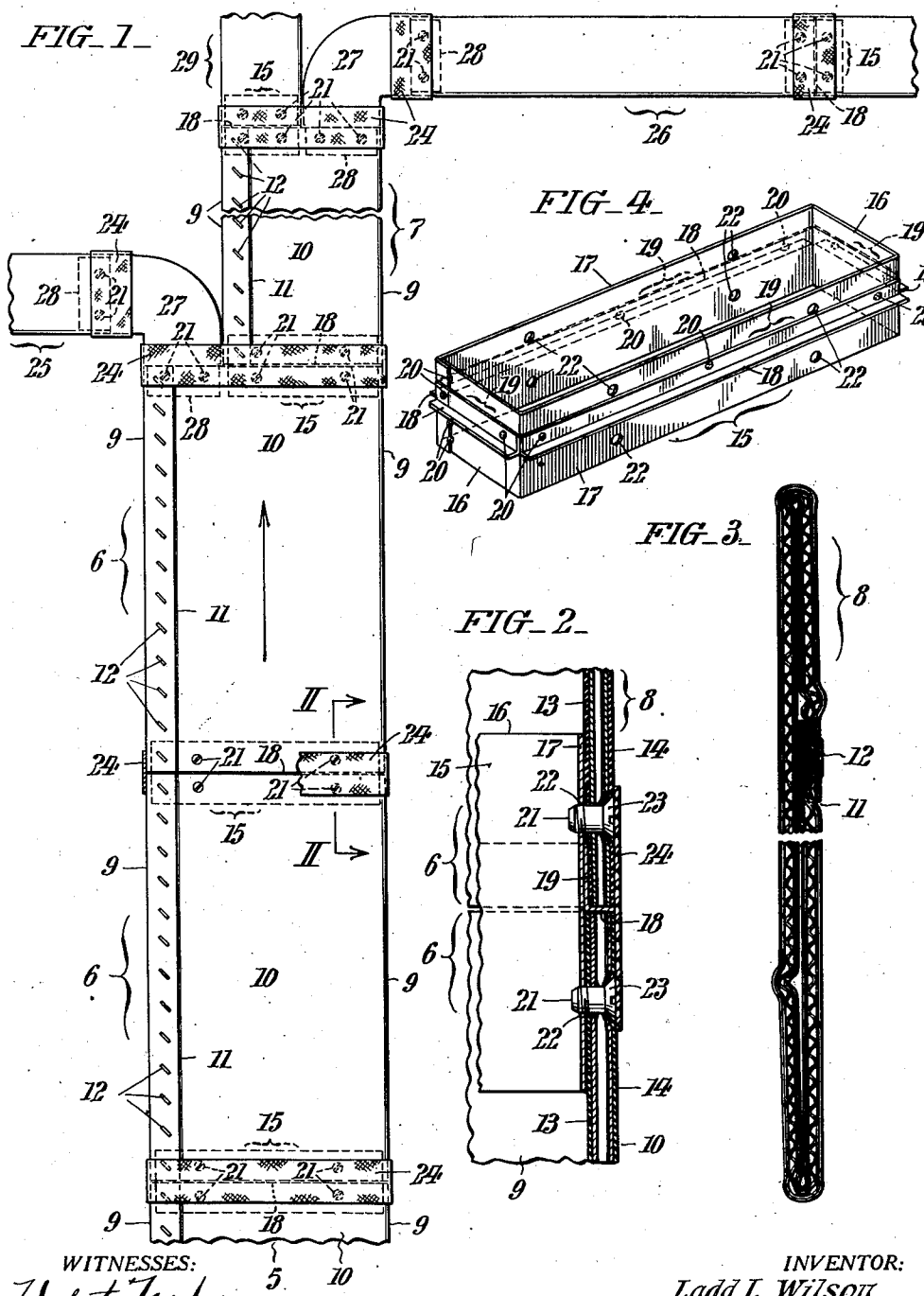


FIG. 4

FIG. 3

FIG. 2

WITNESSES:

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COLLAPSIBLE CONDUIT

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3 Claims. (Cl. 138—53)

This invention has general reference to means for conducting gaseous substance from a source of supply for use and distribution as desired; while it pertains, more particularly to a novel conduit or service connection for warm-air heating appliances for installation in houses, factory buildings, drying rooms and so forth. Heretofore, the atmospheric air warmed by heater of the type referred to has been conducted from said heater through sheet-metal piping functional as heating means rather than as flues. However with the prevailing "priority" on, and extremely limited available supply of, sheet metal for the fabrication of piping, the related manufacturing art has become seriously impaired. Another disadvantage inhering to the production and use of sheet metal piping, not only in connection with heating apparatus, but in kindred arts where such piping has superseded cast metal piping, is the comparatively large space involved for packing and shipping said piping in bulk.

A primary aim of the present invention is to overcome the above specified impairment and disadvantage in a simple and economical manner, by respectively making use of a novel substitute for the sheet metal whereby a saving of approximately 95% in metal is effected; and by the provision of a highly durable conduit capable of compact collapse for package and shipment with resultant considerable saving in overhead and shipment costs.

Another aim of this invention is to provide conduit of the species indicated of differential dimensions with associated connectors, by the use of which the adjoining ends of such conduit may be coupled in substantial abutment, and installations of the conduit made without any juncture flange or union projections.

A further aim of this invention is to furnish collapsible conduit well adapted to "plenum" systems of ventilation wherein heated-air is forced by artificial means and the vitiated air removed by displacement.

A still further aim of this invention is the provision of collapsible conduit having associated connector elements which, when aligned and assembled, with the junctures sealed, will present a substantially smooth and rigid structure.

Yet another aim of the present improvements is to furnish conduit of the above indicated species which readily lends itself to subdivision and branching for take-off of the heated air at desirable levels and in different directions.

With the stated aims and auxiliary advantages in view, this invention consists essentially in the fabrication of conduit from fire-resistant corrugate board, creased to define the desired cross-section of piping, in combination with corresponding section insert connectors having a surrounding medially-located thin flange or fin for snug abutment by the adjoining ends of aligned lengths of said conduit substantially as hereinafter disclosed, typically illustrated by the accompanying sheet of drawings forming a part of this specification, and more particularly defined in the concluding claims.

In the drawing:

Fig. 1 is a broken elevation of a portion of a hot-air piping system embodying the present invention.

Fig. 2 is an enlarged detail section taken approximately as indicated by the angle-arrows II—II in Fig. 1.

Fig. 3 is an end view of one of the conduit sections collapsed for packing and shipment; and,

Fig. 4 is a perspective view of a connector unit hereinafter fully described.

In describing the embodiment of this invention, typified by the above captioned figures, specific terms will be employed for the sake of clarity, but it is to be understood the scope of said invention is not thereby limited; each such term being intended to embrace all equivalents which perform the same function for an analogous purpose.

Referring more in detail to the drawing the numeral **5** conveniently designates the "plenum," and **6** superposed conduit sections, while **7** indicates a relatively smaller continuation, all of which are individually fabricated in accordance with the invention.

Each conduit section **5**, **6** and **7** is preferably fabricated from a sheet of corrugated strawboard **8**, Figs. 2 and 3, severed to the desired size, and creased along paralleling lines so that, when bent therealong, said sheet conveniently defines a rectangular-section pipe of the required size embodying opposed walls **9**, **10**, and an overlap or seam **11** for securement as by "carton" staples **12**. Particular attention is directed to the fact that the strawboard **8**, in accordance with this invention is coated on both planar faces, prior to severance to the desired sizes for formation of the conduits or pipes **5**, **6** and **7**, with an integrated fireproofing substance, such as asbestos, to provide an inner and an outer protective strata or covering **13**, **14** respectively. Furthermore such protective covering **13**, **14** may be rendered moisture-proof in any of the well known ways, if deemed desirable or expedient.

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Conduit or pipe sections 5, 6 and 7, are arranged in end to end alignment and held together by thin suitable material, such as galvanized sheet-metal connectors 15, one of which is shown in perspective in Fig. 4. Each such connector 15 is of a shape conformatory to the bore of the conduit sections 5, 6 or 7 with which it is to be used, while it embodies minor paralleling walls 16 and major walls 17 respectively for snug coaction with the conduit walls 9, 10, in an obvious manner. Substantially surrounding the connector and medially exterior thereto are laterally projecting flanges 18 of a width not exceeding the thickness of the strawboard 8, said flanges conveniently consisting of galvanized sheet-metal angles 19 rigidly secured to the connector 15 as by "tack" welds 20; or, such flanges might be formed integral with said connector without departure from the spirit and scope of this invention.

After the conduit sections 5, 6 and 7 are consecutively aligned with an inserted connector 15 between the adjoining ends the resultant juncture is, preferably, secured by means of appropriate screws 21 driven through the straw-board 8 into registering holes 22 to each side of the angles 19 in an obvious manner; whereupon the conduit closely adjoining ends, as well as the heads 23 of said screws 21, may be sealed by an overlapping strip of adhesive material 24. Now it will be self-evident the joint so formed is not only rigidified in a very simple and efficient manner, but that such joint is sealed against any possibility of leakage from the interior outwards.

For take-off branches 25, 26 appropriate elbows 27, with mating connectors 28 are fitted at different levels; for instance in combination with the lower and upper end of the broken section 7, it being understood the respective parts are properly proportioned for snug coactive interengagement, and that all of such joints are preferably sealed by adhesive strip 24, as before described.

From the foregoing it is thought the merits and advantages of this invention will be self-evident; while it is to be expressly understood that the cross-section of the "plenum" 5, conduit sections 6 and 7, as well as the take-off branches 25, 26, an upper extension 29, Fig. 1, and the connectors 15 and 28 may be of other than rectangular cross-section, such as regular or irregular polygonal shape, without departure from the fundamentals of this invention. Furthermore, it is herein emphasized that the saving of sheet metal effected by this invention is clearly very considerable; while the instant improvements furnish a serviceable and durable substitute-conduit for sheet-metal pipe in hot-air heating apparatus and the like, which is also compactly collapsible for packing or shipment in bulk.

Having thus described my invention, I claim:

1. Conduit fabricated from unitary sheet corrugated fiber-board having an integrated strata of fire-proofing substance on both faces thereof; creases formed along spaced corrugations of said fiber-board to define longitudinal sections with one of the outer sections embodying a similarly-creased relatively-foldable portion to provide an overlap; attaching elements securing said overlap to the complemental outer part of the other outer section of the fiber-board; a thin sheet material insert connector device, having a medially located surrounding fin, in width not exceeding the thickness of the fiber board, rigidly coupling the adjoining ends of aligned lengths of such conduit without exterior projection; and means for attaching the adjoining ends of the conduit to the insert connector.

2. Conduit in accordance with claim 1 wherein the insert connector is provided with a substantially surrounding medially-located fin of a width approximating the thickness of the corrugate straw-board.

3. Conduit in accordance with claim 1 wherein the insert connector is formed of galvanized sheet iron; similar material angles are permanently attached to the connector to define coplanar flanges, projecting medially outwards therefrom; and appropriate screws attach the adjoining conduit ends to the connector.

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